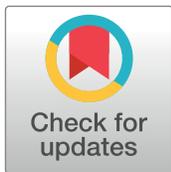




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ORIGINAL ARTICLE

Death anxiety and cyberchondria in patients with chronic obstructive pulmonary disease: a cross-sectional study.

Ansiedad ante la muerte y cibercondría en pacientes con enfermedad pulmonar obstructiva crónica: un estudio transversal

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Chronic obstructive pulmonary disease, anxiety disorders, death anxiety, cyberchondria, internet use, internet-based intervention, internet addiction disorder, compulsive behavior, outpatients

Palabras clave

enfermedad pulmonar obstructiva crónica, trastornos de ansiedad, ansiedad ante la muerte, cibercondría, uso de internet, intervención basada en internet, trastorno de adicción a internet, conducta compulsiva, pacientes ambulatorios.

Abstract

Introduction:

It is suggested that chronic obstructive pulmonary disease (COPD) patients have high death anxiety and the majority of them tend to search for COPD-related information on the internet.

Objective:

Explore the association between death anxiety and cyberchondria in patients with COPD.

Methods:

This descriptive, cross-sectional study included 143 patients diagnosed with COPD aged 45 years or older, who had no sensory impairments affecting communication, were cognitively intact, and actively used the internet.

Results:

A multiple regression analysis examining the Cyberchondria Scale (CS-12) total score in relation to sociodemographic and clinical characteristics found that marital status, regular use of medications, having a COPD exacerbation in the last 6 months, and daily internet use time together explained 35.8% of the variance in the Cyberchondria Scale (CS) score (Adj R²= 0.358, $p < 0.001$). Additionally, it was discovered that doing regular breathing exercises, being hospitalized in the last 6 months, searching for information about the COPD on the internet and use any medication other than those prescribed (such as analgesic, antipyretics, anti-emetics, etc.) by their doctor in the last year explained 37.3% of the variance in the Death Anxiety Score (Adj R²= 0.373, $p < 0.001$).

Conclusions:

The findings indicate that patients with COPD exhibited moderate levels of cyberchondria and high levels of death anxiety, highlighting the relevance of psychological factors in this patient group.

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Conflict of interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper

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Z.E. Conceptualization, Methodology, Formal analysis, Data curation, Writing - original draft, Writing - review & editing, Supervision.

A.T.E.: Methodology, Investigation (data collection), Data curation, Writing - review & editing, Supervision

Data Availability

Data will be made available on request

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Resumen

Introducción:

Se sugiere que los pacientes con enfermedad pulmonar obstructiva crónica (EPOC) presentan altos niveles de ansiedad ante la muerte y que muchos buscan información sobre la EPOC en internet.

Objetivos:

Explorar la asociación entre la ansiedad ante la muerte y la cibercondría en pacientes con EPOC.

Métodos:

Este estudio descriptivo y transversal incluyó a 143 pacientes diagnosticados con EPOC, mayores de 45 años, sin alteraciones sensoriales que afectaran la comunicación, cognitivamente íntegros y usuarios activos de internet.

Resultados:

Un análisis de regresión múltiple examinó la puntuación total de la Escala de Cibercondría (CS-12) en relación con características sociodemográficas y otras variables. Se encontró que el estado civil, el uso regular de medicamentos, haber presentado una exacerbación de la EPOC en los últimos 6 meses y el tiempo diario de uso de internet explicaron conjuntamente el 35.8% de la varianza en la puntuación de la Escala de Cibercondría (R^2 ajustado= 0.358; $p < 0.001$). Además, se descubrió que realizar ejercicios respiratorios regularmente, haber sido hospitalizado en los últimos 6 meses, buscar información sobre la EPOC en internet y utilizar medicamentos distintos a los prescritos por el médico (analgésicos, antipiréticos, antieméticos, etc.) en el último año explicaron el 37.3% de la varianza en la puntuación de Ansiedad ante la Muerte (R^2 ajustado= 0.373; $p < 0.001$)

Conclusiones:

Los hallazgos indican que los pacientes con EPOC presentaron niveles moderados de cibercondría y altos niveles de ansiedad ante la muerte, lo que resalta la relevancia de los factores psicológicos en este grupo.

Remark

1) Why was this study conducted?

- Most individuals with COPD tend to seek COPD health-related information via the internet.
- However, the level of their abnormal online health-related information searches (cyberchondria) is unknown.

2) What were the most relevant results of the study?

- Patients with COPD exhibited high levels of death anxiety and moderate levels of cyberchondria, with a positive association between the two.
- Cyberchondria levels were associated with marital status, regular medication use, recent COPD exacerbations, and daily internet use duration.

3) What do these results contribute?

- This study explores the association between death anxiety and cyberchondria in patients with COPD, contributing to the existing literature.
- The findings demonstrate associations between death anxiety, cyberchondria, and selected clinical and internet use variables.

Introduction

COPD is the third leading cause of death worldwide and in Turkey. Its most prominent physical symptoms include chronic cough, excessive mucus production, and dyspnea ^{1,2}.

As COPD progresses, symptoms become more complex and often spiral into a challenging mix of interrelated physical, emotional, and psychosocial problems that are difficult to manage, often due to related comorbidities. The management of COPD varies depending on the intensity and severity of symptoms, the frequency of exacerbations, the severity of the condition, and the recurrence of hospital admissions ^{3,4}.

Patients with COPD may experience difficulties in accessing healthcare services due to advanced age, comorbidities, limited mobility, social isolation, and residence in rural areas ³⁻⁵. In this context, many patients turn to the internet for health-related information. Reported internet use among individuals with COPD ranges from 40% to 49.7% ^{6,7}. Studies indicate that patients who perceive unmet healthcare needs, delayed diagnosis, insufficient treatment, or limited physician communication tend to use the internet more frequently for health-related information.

Although the internet is a valuable source for seeking and sharing information, if the information obtained online is inaccurate or outdated, it can be confusing for patients and may increase anxiety ⁸. This situation, particularly for individuals who are already distressed or stressed about their health, can lead to increased worry and fear, resulting in repetitive health-related searches. In the literature, this phenomenon is referred to as “cyberchondria” ^{9,10}. One of the primary reasons for seeking medical information online is to reduce uncertainty. The literature demonstrated a significant positive relationship between intolerance of uncertainty and cyberchondria ¹⁰⁻¹². It was suggested that individuals with higher levels of intolerance to uncertainty experienced greater death anxiety and engaged in excessive health-related internet searches (cyberchondria) as a way to alleviate their increased death anxiety ¹⁰.

COPD is characterized by an uncertain prognosis, persistent symptoms despite treatment, sudden exacerbations, long-term medication use, and frequent hospital dependence, all of which may contribute to psychological distress ¹³. The literature indicates that patients with COPD experience high levels of death anxiety, particularly related to dyspnea and air hunger, which can significantly limit daily functioning ¹⁴. In addition to death anxiety, cyberchondria may further complicate the psychological burden experienced by patients with COPD.

Repeated online health searches have been reported to reinforce health-related anxiety rather than alleviate it ¹⁵⁻¹⁹. Cyberchondria is often an overlooked issue in both outpatient and clinical settings ^{15,17,19}. Despite the growing interest in psychological aspects of COPD, only a limited number of studies have examined death anxiety in this patient population ^{13,14,18}, and no studies have specifically investigated its association with cyberchondria. Addressing this gap, the present study aims to explore the association between death anxiety and cyberchondria in patients with COPD and to examine their relationships with selected clinical and internet use characteristics. The findings are expected to contribute to the literature by improving the understanding of the association between cyberchondria and death anxiety in this patient population.

Materials and Methods

Study design and participants

A descriptive cross-sectional design was used in this study. The study population consisted of all COPD-diagnosed patients (n= 181) who visited the pulmonary disease outpatient clinics of a university hospital between February 27, 2024, and June 21, 2024. The study sample included 143 patients who met the inclusion criteria during the study period. The sample size was calculated using G*Power version 3.1.9.2, assuming a medium effect size (effect size= 0.244), an alpha level of 0.05, and a statistical power of 95%, resulting in a required sample size of 143 participants.

Inclusion Criteria. Inclusion criteria for the study were as follows: patients diagnosed with COPD who were older than 40 years, actively used the internet, had no communication problems, were conscious, and agreed to participate. Those who did not actively use the internet or had mental and cognitive impairments were excluded from the study.

Ethical Considerations. Before initiating the study, ethical approval was obtained from the university Clinical Research Ethics Committee (dated 07.02.2024, protocol no: 2024/03), along with institutional permission and written informed consent from all the participants.

Data Collection

The research data were collected through face-to-face interviews using the Individual Identification Form, the Cyberchondria Severity Scale-Short Form (CSS-12), and the Death Anxiety Scale (DAS).

Data Collection Instruments. The individual identification form: consisted of 15 items. The researchers designed this form based on a literature review. The form included questions regarding sociodemographic (such as age, gender, income, education, marital status, clinical status (comorbidity, oxygen utilization, experiencing an episode (COPD exacerbation), hospitalization), and internet usage characteristics (daily internet use duration, daily internet use frequency).

Cyberchondria Severity Scale-Short Form (CSS-12): the scale, developed by McElroy *et al.*²⁰, and validated for reliability and validity by Yorgancıoğlu *et al.*²¹, consists of 4 factors and 12 items in a 5-point Likert format. The total score ranges from 12 to 60, with higher scores indicating an increased level of cyberchondria. The subdimensions of the scale are as follows:

- Excessiveness: increased repetitive searches (items 1, 3, and 6).
- Distress: stress and discomfort resulting from searches (items 4, 8, and 9).
- Reassurance Seeking: searches leading individuals to seek professional medical advice (items 5, 11, and 12).
- Compulsion: web searches interfering with other aspects of online/offline life (items 2, 7, and 10)^{20,21}.

In this study, Cronbach's alpha for the scale was 0.83, indicating high internal consistency.

Death Anxiety Scale (DAS): The scale was developed by Templer²², and its validity and reliability were studied in Turkey by Akça²³. It is a 15-item, true-false response scale designed to measure an individual's anxiety and fear related to their death. For the first nine items, each "yes" response is scored as one, while "no" responses receive zero points. For the remaining six items, each "no" response is scored as one, while "yes" responses receive zero points. The total score obtained by the participant represents their level of death anxiety. The highest possible score on the test is 15, with higher scores indicating greater death anxiety. In the reliability study conducted by Akça and Köse, the scale's internal consistency coefficient was found to be $\alpha = 0.75$. In this study, the Cronbach's alpha coefficient for the scale was 0.81^{22,23}.

Data analysis. The data were analyzed using SPSS version 24.0 (IBM SPSS for Windows, ver. 24). In calculating sample size, each variable's power (test power) was set at least 80%, with a type I error of 5%. Parametric tests were applied in the study because the variables were normally distributed. The descriptive statistics for continuous variables in the study were presented as mean and standard deviation, whereas those for categorical variables were presented as frequency and percentage. The independent samples t-test, one-way ANOVA test, and the multiple linear regression analysis were used to determine the differences between the groups. Pearson correlation analysis was used to determine the effects of independent variables. The statistical significance level (α) was set at 5% in the calculations. $p < 0.05$ was accepted as statistically significant.

Table 1. Distribution of the mean scores of DAS, CSS-12, and the relationship between scale scores of the patients

Scale Scores	DAS Total	CSS-12 Total	Excessiveness	Distress	Reassurance Seeking	Compulsion	
Mean ± SD	12.30 ± 4.03	28.14 ± 6.87	7.57 ± 2.82	8.61 ± 2.50	6.33 ± 1.96	5.65 ± 1.75	
CSS-12 Total	r	0.22	1	781	519	863	764
	p	0.01**	-	0.000**	0.000**	0.000**	0.000*
>DAS Total	r	12.000	0.22	-0.21	17	256	389
	p	-	0.01**	0.83	0.86	0.01**	0.01**

r: Correlation coefficient ** p <0.001 DAS: Death Anxiety Scale; CSS-12: Cyberchondria Severity Scale-Short Form (CSS-12)

Table 2. Distribution of sociodemographic and some clinical characteristics of patients (n= 143)

Sociodemographic and some clinical characteristics	Number (n)	Percentage (%)
Gender		
Male	79	55.2
Marital status		
Married	126	88.1
Education level		
Literate	38	26.6
Primary school graduate	70	49.0
High school graduate	27	18.9
Bachelor	8	5.5
Income		
More than expenses	12	8.4
Equal to expenses	103	72.0
Less than expenses	28	19.6
Smoking status		
Yes	36	25.2
No	55	38.5
I quit	52	36.3
Alcohol consumption		
Yes	15	10.5
No	113	79.0
I quit	15	10.5
Comorbid chronic disease		
Yes	100	69.9
The person he/she lives with		
Alone	14	9.8
Spouse	68	47.6
Spouse and children	59	41.3
Other	2	1.3
Regular use of medications		
Yes	134	93.7
Regular check-ups		
Yes	110	76.9
Regular breathing exercises		
Yes	104	72.7
Stages of COPD		
Mild	32	22.4
Moderate	60	42.0
Severe	42	29.4
Very Severe	9	6.2
Oxygen use at home		
Yes	51	35.7
COPD exacerbation in the last 6 months		
Yes	57	39.9
Hospitalization due to COPD in the last 6 months		
Yes	72	50.3
Other variables included in the correlation analysis	Mean ± SD	
Age	67.55 ± 9.39	
Number of medications taken daily	4.42 ± 0.62	
Years of Smoking	37.14 ± 6.71	

Results

The distribution of participants' total and subdimension mean scores on the DAS and the CSS-12, as well as the relationships between the scale scores, are presented in Table 1.

The participants' mean DAS score was 12.30 ± 4.03 , indicating high death anxiety. The mean CSS-12 total score was 28.14 ± 6.87 , suggesting above-moderate levels of cyberchondria.

The mean scores for the subdimensions of CSS-12 were as follows: excessiveness: 7.57 ± 2.82 , distress: 8.61 ± 2.50 , reassurance seeking: 6.33 ± 1.96 , and compulsion: 5.65 ± 1.75 . A low positive correlation was found between DAS and CSS-12 total score ($p < 0.001$; $r = 0.22$). Additionally, a low positive correlation was observed between DAS and the reassurance-seeking subdimension ($p < 0.001$; $r = 0.256$), while a moderate positive correlation was found between DAS and the compulsion subdimension ($p < 0.001$; $r = 0.389$). However, there was no significant relationship between DAS and the excessiveness and distress subdimensions ($p > 0.05$).

The distribution of patients' sociodemographic and some clinical characteristics is presented in Table 2.

The mean age of the patients was 67.55 ± 9.39 years; more than half (55.2%) were male, and the majority (88.1%) were married. Nearly half (49.0%) had completed primary education, 47.6% lived with their spouse, and the majority (72.0%) reported that their income was equal to their expenses. A large proportion of the patients did not consume alcohol (79.0%) or smoke (38.5%). On average, they had smoked for 37.14 ± 6.71 years. Additionally, most patients (69.9%) had an additional chronic disease.

The patients took an average of 4.42 ± 0.62 medications daily, with the majority (93.7%) using their medications regularly. Most patients (76.9%) attended regular health check-ups, and 72.72% practiced regular breathing exercises. Approximately 29.4% of the patients had severe-stage COPD, and 35.7% used oxygen therapy at home. In the past six months, 39.9% have experienced COPD exacerbation, and nearly half (50.3%) have been hospitalized due to COPD.

The internet usage characteristics of patients with COPD are presented in Table 3. The majority of patients (84.0%) used the internet for 1-3 hours per day, and more than half (60.13%) searched online for information about COPD. A total of 24.43% reported frequently using the internet for health-related searches, while 37.76% did not find online health information reliable. Only a small percentage (11.2%) checked the accuracy of their doctor's information online. Additionally, it was found that a minority of the patients (7%) did use any medication other than those prescribed (such as analgesics, antipyretics, antiemetics, etc.) by their doctor in the last year.

Table 3. Characteristics of patients' internet usage (n=143)

Variables	Number (n)	Percentage (%)
Daily internet usage time in hours		
1-3	123	84.0
4-6	17	11.9
7 or more	3	2.1
Search the internet for COPD		
Yes	86	60.1
Frequency of searches related to COPD (n=86)		
Rarely	51	59.3
Frequently	14	16.3
Very often	21	24.4
Do you find health information on the internet reliable?		
Yes	48	33.6
No	54	37.8
Partially	41	28.7
Do you check the accuracy of the information provided by your physician on the internet?		
Yes	16	11.2
Use any medication other than those prescribed (such as analgesics, antipyretics, antiemetics, etc.) by their doctor in the last year.		
Yes	10	7.0

Table 4. Regression analysis of the total CSS-12 score according to sociodemographic, clinical, and internet usage characteristics in patients with COPD

CSS-12 total	Unstandardized B	Beta	t
Constant	49.158		3.562***
Gender	-5.432	-0.315	-1.569
Marital status	16.294	0.440	2.097*
Income	-1.498	-1.108	-0.659
Regular use of medications	-24.171	-0.469	-2.294*
COPD exacerbation in the last 6 Months	-11.606	-0.568	-3.640***
Daily internet usage	6.530	0.353	2.364*
Searching for disease-related information online	4.705	0.174	0.989
Finding online information reliable	0.237	0.022	0.145

Ra= 0.726, R2= 0.528, Adj R2: 0.358, F= 3.102 **p* <0.05, ***p* <0.001, ****p* <0.001

When the total CSS-12 score was analyzed using multiple regression based on sociodemographic and certain clinical characteristics, the model indicated that marital status, use their medications regularly, history of COPD exacerbation in the past six months, and daily internet usage time explained 35.8% of the variance in the CSS-12 total score (Adj R² = 0.358, *p* <0.001) (Table 4).

According to the model, participants' CSS-12 scores were 0.469 units lower for those who did not regularly use their medication than for those who did (B: -0.469, t: -2.294, *p* < 0.03). Similarly, those who had not experienced a COPD exacerbation in the past six months had scores 0.568 units lower than those who had (B: -0.568, t: -3.640, *p* <0.001). In contrast, the CSS-12 scores were 0.440 units higher among married participants than among singles (B: 0.440, t: 2.097, *p* < 0.04). Additionally, those who used the internet for six or more hours daily had 0.353 units higher scores than those who used it for 1-2 hours/day or 3-5 hours/day (B: 0.353, t: 2.364, *p* <0.02) (Table 4).

When the DAS total score was analyzed using multiple regression based on sociodemographic, clinical, and internet usage characteristics (Table 5), the model indicated that regular breathing exercises, hospitalization in the past six months, searching for COPD -related information online and use any medication other than those prescribed (such as analgesic, antipyretics, anti-emetics, etc.) by their doctor in the last year explained 37.3% of the variance in the DAS score (Adj R²= 0.373, *p* <0.001).

According to the model, participants who did not perform regular breathing exercises had a DAS score 1.961 units lower than those who did (B: -1.961, t: -2.335, *p* <0.021). Similarly, those who were not hospitalized in the past six months had DAS scores 3.828 units lower than those who were hospitalized (B: -3.828, t: -4.557, *p* <0.001). Additionally, those who did not search for COPD-related information online had 2.829 units lower DAS scores compared to those who did (B: -2.829, t: -3.083, *p* <0.003), and didn't use any medication other than those prescribed (such as analgesic, antipyretics, anti-emetics, etc.) by their doctor in the last year had 4.556 units lower DAS scores compared to those who did use. (B: -4.556, t: -2.577, *p* <0.01) (Table 5).

Table 5. Regression analysis of the total DAS score according to sociodemographic, clinical, and internet usage characteristics in patients with COPD

DAS	Unstandardized B	Beta	t
Constant	34.657		5.450***
The person he/she lives with	-0.192	-0.026	-3.173
Regular check-ups	-0.187	-0.041	-0.573
Alcohol consumption	0.857	0.080	0.080
Regular breathing exercises	-1.961	-0.174	-2.335*
Stage of COPD	0.350	0.058	0.593
Oxygen use at home	-1.012	-0.096	-1.061
Hospitalization in the last 6 months	-3.828	-0.380	-4.557***
Searching for COPD on the internet	-2.829	-0.300	-3.083**
Daily internet usage time	0.983	0.134	1.239
Frequency of Internet use	-0.810	-0.144	-1.439
Use any medication other than those prescribed (such as analgesics, antipyretics, antiemetics, etc.) by their doctor in the last year.	-4.556	-0.201	-2.577*

DAS: Depression Anxiety Scale. Ra= 0.655, R2= 0.429, Adj R2: 0.373, F= 7.632 **p* <0.05, ***p* <0.001, ****p* <0.001

Discussion

This study examines the level of cyberchondria in patients with COPD and explores its association with death anxiety. With the increasing prevalence of internet use, individuals are more frequently seeking health-related information online²¹. In this study, patients with COPD exhibited a moderate level of cyberchondria. Cyberchondria, particularly among individuals with health-related anxiety, is characterized by frequent online health-related searches and has been associated with higher levels of anxiety and psychological distress²¹. COPD is a condition commonly accompanied by anxiety due to its persistent symptoms²⁴.

In this study, marital status, regular medication use, history of COPD exacerbation in the past six months, and daily internet use were associated with higher CSS-12 scores, explaining 35.8% of the variance. Married patients, those using medications regularly, patients with recent exacerbations, and individuals using the internet for six or more hours daily reported higher levels of cyberchondria. Marital status was associated with cyberchondria levels, consistent with some previous research^{15,25,26}. While some studies report higher scores among married individuals and others among single individuals, these discrepancies may be attributable to differences in sample characteristics^{15,25,26}. Overall, these findings suggest that certain sociodemographic and clinical characteristics are associated with levels of cyberchondria among patients with COPD.

In this study, patients with COPD who reported regular medication use also had higher levels of cyberchondria. Frequent online searches for symptoms and treatment options have been associated with increased anxiety and cyberchondria in previous research²⁵. These findings are consistent with the literature suggesting that individuals with chronic illnesses may engage in health-related research, which can be linked to higher cyberchondria scores.

Patients with COPD who had experienced recent exacerbations reported higher levels of cyberchondria. Previous studies have similarly found that exacerbations are associated with increased online health information-seeking behavior^{3,7}. These findings are consistent with the literature, which suggests that clinical characteristics are associated with levels of cyberchondria.

In this study, patients with COPD who reported using the internet for 6 or more hours per day had higher scores on the Cyberchondria Scale. Previous research has shown that individuals with chronic diseases tend to engage more frequently in online health information-seeking behaviors²⁷⁻²⁹. Increased internet use has been associated with higher levels of health-related anxiety and cyberchondria in different patient populations^{27,30}. These findings suggest that the duration of internet use may be associated with levels of cyberchondria among patients with COPD.

Moreover, disease-specific anxieties have been described as associated with death anxiety, and previous studies have reported high levels of death anxiety among patients with COPD. Similarly, in this study, COPD patients demonstrated high DAS scores, consistent with the literature^{14,18,31,32}.

We also found that regular performance of breathing exercises, hospitalization within the past six months, online searching for COPD-related information, and the use of medications other than those prescribed (such as analgesics, antipyretics, antiemetics, etc.) by a physician were associated with higher levels of death anxiety in patients with COPD. In the regression analysis, these variables explained 37.3% of the variance in DAS scores.

In this study, patients with COPD who regularly performed breathing exercises had higher death anxiety scores. Dyspnea is a common and distressing symptom in COPD and has been associated with increased psychological burden, including death anxiety, in previous studies³²⁻³⁴. Breathing exercises are commonly used in the management of COPD and may be more frequently practiced by patients experiencing greater symptom-related distress.

Patients with COPD who had been hospitalized within the past six months reported higher levels of death anxiety. Hospitalization has been associated with increased psychological burden in patients with chronic illnesses, including COPD, as reported in previous studies^{35,36}. These findings suggest that recent hospitalization is associated with higher levels of death anxiety in patients with COPD.

In this study, patients who searched for COPD-related information online reported higher death anxiety scores. Previous studies have shown that online health information seeking is common among patients with COPD and other chronic diseases^{6,19,37-39}. Online searching for disease-related information has been associated with higher levels of health-related anxiety in different patient populations^{37,38}. These findings suggest that searching for COPD-related information online may be associated with death anxiety in patients with COPD.

In our patient group, significant associations were found between the DAS total score and both the CSS-12 total score and its Reassurance Seeking and Compulsion subdimensions. These findings indicate that higher levels of death anxiety are associated with higher levels of cyberchondria, particularly in relation to reassurance-seeking and compulsive online health-search behaviors in patients with COPD.

Conclusions

This study demonstrated associations between cyberchondria, death anxiety, and selected sociodemographic, clinical, and internet use-related variables in patients with COPD.

Marital status, regular medication use, recent COPD exacerbation, and daily internet use duration were associated with cyberchondria levels, while regular breathing exercises, recent hospitalization, use of non-prescribed medications, and searching for COPD-related information online were associated with death anxiety.

In addition, higher levels of cyberchondria were associated with higher levels of death anxiety.

Given the cross-sectional design of the study, these findings should be interpreted as associative rather than causal. These results contribute to the understanding of the association between cyberchondria and death anxiety in patients with COPD.

Study limitations and strengths

The cross-sectional design does not allow conclusions regarding causality or the direction of the relationships between cyberchondria and death anxiety.

Additionally, the sample consisted only of patients with COPD who use the internet; therefore, the findings cannot be generalized to non-internet users. Finally, the study was conducted in a single setting, which may limit the generalizability of the results to broader COPD populations.

This study has several strengths. It contributes to the literature by examining the association between cyberchondria and death anxiety in patients with COPD and by providing findings specific to this patient group. The use of valid and reliable measurement tools enhances the credibility of the findings. At the same time, the inclusion of psychological variables alongside selected clinical and internet-use characteristics enables evaluation of the results within a comprehensive framework.

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